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March 25, 2015

Colorado Department of Public Health & Environment

APCD-SS-B1

4300 Cherry Creek Drive South

Denver, CO 80246-1530



Subject: Modifications to Permit 12EP1155

Walmart Colorado Data Center, Facility #7497

Colorado Springs, CO

To Whom It May Concern:

Wal-Mart Stores, Inc. (Walmart) is hereby requesting a revision to existing permit 12EP1155 to address the addition of six (6) new diesel internal combustion engines powering backup power generators at its Colorado Data Center located at 10625 Federal Drive in Colorado Springs. As described in the original permit application for this facility in 2012, Walmart plans to install a total of twenty-four (24) diesel engines (all associated with emergency generators) in four phases of construction involving the addition of 6 generators per phase. As required by the APCD in order to avoid any question of permitting circumvention, the facility was permitted for all 24 engines up front despite the fact that only 6 engines would be installed initially. Condition #3 in the permit was worded to allow for construction of the facility in four phases spread out over several years. This application addresses the 2nd phase of the four phases referenced in Permit 12EP1155.

The 6 engines associated with this phase (Phase 2) of construction will be newly fabricated for the facility (i.e., "new" engines). They will have the same manufacturer (Caterpillar), Model Number (3516C), and maximum size rating (3,634 HP) as the first 6 engines installed at the facility. These engines will be subject to 40 CFR Part 60, Subpart IIII. Each engine will have an associated 200 gallon aboveground storage tank (AST) for diesel fuel referred to as "day tanks." The day tanks will be supplied by two (2) existing 30,000 gallon underground storage tanks (USTs). No additional diesel USTs are planned for this phase of construction. As indicated in the original 2012 permit application, there is no propane or natural gas feed to the facility so there are no propane/natural gas combustion sources. No additional cooling towers are being added in this phase of construction; however, the fourth of 4 cells in existing Cooling Tower #1 will be fitted out and placed into operation as a part of this phase. All 4 cells of Cooling Tower #1 were built during the initial phase of construction but only 3 of the cells are currently operational. The footprint of the building will not be changed/expanded as part of this phase of construction.

The 200 gallon diesel day tanks and the cooling towers are insignificant sources of air emissions and are APEN and Permit Exempt.

Updated Project Schedule / Phases

The projected schedule for the four construction phases of the Colorado Data Center are shown in the table below.

Emission Source (as identified in Permit 12EP1155)	Emission Source (Walmart identification number)	AIRS ID Number	Projected Year of Initial Operation
Generator #1	Generator #10	041 / 2067 / 001	2012 (actual)
Generator #2	Generator #11	041 / 2067 / 002	2012 (actual)
Generator #3	Generator #12	041 / 2067 / 003	2012 (actual)
Generator #4	Same as permit	041 / 2067 / 004	2012 (actual)
Generator #5	Same as permit	041 / 2067 / 005	2012 (actual)
Generator #6	Same as permit	041 / 2067 / 006	2012 (actual)
Generator #7	Same as permit	041 / 2067 / 007	2015
Generator #8	Same as permit	041 / 2067 / 008	2015
Generator #9	Same as permit	041 / 2067 / 009	2015
Generator #10	Generator #1	041 / 2067 / 010	2015
Generator #11	Generator #2	041 / 2067 / 011	2015
Generator #12	Generator #3	041 / 2067 / 012	2015
Generator #13	Same as permit	041 / 2067 / 013	2017
Generator #14	Same as permit	041 / 2067 / 014	2017
Generator #15	Same as permit	041 / 2067 / 015	2017
Generator #16	Same as permit	041 / 2067 / 016	2017
Generator #17	Same as permit	041 / 2067 / 017	2017
Generator #18	Same as permit	041 / 2067 / 018	2017
Generator #19	Same as permit	041 / 2067 / 019	2020
Generator #20	Same as permit	041 / 2067 / 020	2020
Generator #21	Same as permit	041 / 2067 / 021	2020
Generator #22	Same as permit	041 / 2067 / 022	2020
Generator #23	Same as permit	041 / 2067 / 023	2020
Generator #24	Same as permit	041 / 2067 / 024	2020
Cooling Tower #1	Same as permit	041 / 2067 / 025	2012 (actual)
Cooling Tower #2	Same as permit	041 / 2067 / 026	2015

The new generators and their associated diesel engines are expected to be delivered to the Colorado Data Center in April 2015 with preliminary plans to install/connect and begin operation of the generators in August 2015.

No new AIRS ID numbers will be necessary as there will be no emission points not already reflected in current permit 12EP1155.

Summary of Air Pollutant Emission Notice (APEN) Forms

This submittal package includes updated APENs for all 24 generator engines. The updated APENs reflect revisions to the estimated air emissions for each engine (see separate discussion regarding revisions to air emissions calculations). In addition to the revised emission levels, the APENs for the initial 6 engines installed at the Colorado Data Center in 2012 have been updated to include the current permit number as well as all relevant dates, serial numbers, and AIRS ID numbers. There have been no physical changes to the engines installed in 2012.

Similarly, the APENs for the engines to be installed in 2015 have been updated to reflect updated emissions estimates, dates (where known), the current permit number, and AIRS ID numbers. Serial numbers are not yet available and will be provided with the Initial Startup Notification along with additional date information such as startup dates and manufacture dates.

The APENs for the Phase 3 engines (Generators 13 through 18) have been updated to reflect revised emissions estimates as well as the current permit number, AIRS ID numbers, and a revised projected startup date in the year 2017 instead of 2016. It is assumed at this time that the engines purchased and installed in Phase 3 will be identical to the initial 12 engines at the facility. If Walmart elects to install different makes or models of engines in future phases, revised APEN forms will be submitted prior to the installation and operation of such engines.

The APENs for the Phase 4 engines (Generators 19 through 24) have been updated to reflect revised emissions estimate as well as the current permit number and AIRS ID numbers. As with the Phase 3 engines, it is currently assumed that the Phase 4 engines will be identical to the initial 12 engines (Phases 1 and 2). Revised APEN forms will be submitted at a future date if different make and/or models of engines will be installed as part of Phase 4.

Operational Limitations

As indicated on the APEN forms for each engine, Walmart is seeking to limit the operating hours of each generator (diesel engine) to reduce potential emissions for the facility. Specifically, Walmart is seeking to lower the allowable operating hours per year (rolling 12-month basis) from 100 hours/year to 99 hours/year per engine. The purpose of this limitation is to keep potential emissions below the levels that require emissions modeling, specifically to keep NOx emissions below 40 tons/year.

Revisions to Engine Emissions Calculations

Included with this submittal package are revised estimates of engine emissions as well as the basis behind those calculations. The two significant revisions to the engine emission estimates are as follows:

- Use of emissions data from the manufacturer (Caterpillar) specific to the *engine model* that is (and will be) installed and operated at the Colorado Data Center as opposed to the use of emission rates from EPA engine certification data specific to the *engine family* as previously used in the 2012 permit application.
- Correcting maximum engine load and emission rates based on altitude. The original emission calculations used in 2012 used sea-level emission rates and did not account for altitude corrections. Due to the elevation of the Colorado Data Center, the existing and new engines cannot operate at their maximum design horsepower rating which is based on sea-level conditions. The manufacturer's horsepower rating for the engine at various altitudes was interpolated to determine the maximum horsepower rating of the engine at site conditions (6,707 feet and 70 °F). This showed that the engines cannot operate at more than approximately 87.5% load (3,180 BHP). Emission rates at 100% load and 75% load were then interpolated to estimate engine emissions at 87.5% load (3,180 BHP).

Modeling Threshold Review

Based on 99 hours of operation per year for all 24 engines and 8760 hours per year for both cooling towers, it is estimated that potential emissions from the facility are below the levels that require emissions modeling. NOTE: Cooling tower emissions estimates were included with the 2012 permit application and have not changed (combined total of 0.41 tons/year of PM₁₀ and PM_{2.5} emissions for both towers).

Pollutant	Modeling Threshold (tons/year)	Potential Annual Emissions (tons/year)
Nitrogen Oxides (NOx)	40	39.9
Carbon Monoxide (CO)	100	2.81
Sulfur Dioxide (SO ₂)	40	0.05
PM ₁₀	15	0.70
PM _{2.5}	5	0.70

It is conservatively assumed that all particulate matter emissions from the engines and cooling towers are less than 2.5 microns.

Expected and Requested Revisions to Permit 12EP1155

It is anticipated that the revisions necessary to Permit 12EP1155 should be relatively minimal.

- Obviously, the description of equipment (emission sources) listed in the permit will need to be updated.
- Permit Condition #3 – Walmart is requesting that two of the dates listed in this condition be updated to better reflect the revised construction schedule for the facility and to better ensure that the permit does not expire. Specifically, the requested revisions are shown here in bold text. “...does not commence construction/modification or operation of GEN #7 – 12 within 18 months after January 1, 2015, does not commence construction/modification or operation of GEN #13 – 18 within 18 months after January 1, 2017...”
- Permit Condition #7 – Revise emission rates shown in the tables based on the updated emission calculations included with this permit modification submittal.
- Permit Condition #8 – Revise hours of operation limit from 100 hours per year to 99 hours per year per engine.

Summary of Documentation Included with this Submittal Package

- Site Plan and Aerial Photo
- 24 revised APEN forms (Form APCD-201) for Reciprocating Internal Combustion Engines (1 for each engine).
- 24 APEN Addendum forms (Non-criteria reportable APEN Addendum) showing emissions for additional HAPs not listed on Form APCD-201 (1 for each engine).
- Engine emission calculations and basis.
- Manufacturer’s specifications and emissions data for the 6 new generator sets (generator and associated engine). The 6 new gensets will be identical so the provided specifications apply to all 6.
- EPA Certificate of Conformity for the engine model associated with all of the new engines (generators #7 through 12).
- Cooling tower emissions calculations and basis (unchanged from 2012 permit application submittal).
- Cooling tower specifications (unchanged from 2012 permit application submittal).
- Copy of the agreement between Wal-Mart Stores, Inc. and CB&I (Shaw Environmental, Inc.) granting CB&I limited power of attorney to sign environmental permit applications as an agent for Walmart.
- Copy of existing permit 12EP1155.
- Fee payment in the amount of \$3,669.60 based on \$152.90 per APEN x 24 APEN forms.

Walmart Colorado Data Center #7497
Application for Modification to Permit 12EP1155
Colorado Springs, CO
Page 5

Any questions regarding this submittal may be directed to my attention at the contact information provided below.

Thank you.

A handwritten signature in black ink that reads "Michael Lewis". The script is cursive and fluid.

Michael Lewis, P.E.
Sr. Environmental Engineer
913-317-2630
michael.lewis@cbi.com

cc: James Hoelscher, Sr. Manager, Wal-Mart Stores, Inc., Bentonville, AR

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

SITE PLAN AND AERIAL PHOTO



ISSUES	
1	10/20/2011
2	10/20/2011
3	10/20/2011
4	10/20/2011
5	10/20/2011
6	10/20/2011
7	10/20/2011
8	10/20/2011
9	10/20/2011
10	10/20/2011
11	10/20/2011
12	10/20/2011

REVISIONS	
1	10/20/2011
2	10/20/2011
3	10/20/2011
4	10/20/2011
5	10/20/2011
6	10/20/2011
7	10/20/2011
8	10/20/2011
9	10/20/2011
10	10/20/2011
11	10/20/2011
12	10/20/2011



**KETTLE CREEK
DATA CENTER**
10625 FEDERAL DRIVE
COLORADO SPRINGS, COLORADO

SITE PLAN

JOB 11142.0000
DATE 08/19/11
SHEET

A01-01

Existing Generators 1, 2, 3
(referred to internally by Walmart
as Generators 10, 11, 12)

Location for New
Generators 7, 8, 9

Existing
Generators 4, 5, 6

Location for New Generators 10,
11, 12 (referred to internally by
Walmart as Generators 1, 2, 3)

NOTE: Areas designated as
"Future Addition" are not a part of
this phase of facility changes

1 SITE PLAN
1" = 80'

Google



Colorado Data Center

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Imagery ©2015 Google, Map data ©2015 Google

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

**RECIPROCATING INTERNAL COMBUSTION ENGINE
AIR POLLUTANT EMISSION NOTICE (APEN) FORMS**

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

GENERATOR SET EMISSIONS CALCULATIONS AND SUPPORTING DOCUMENTATION

Walmart Data Center - Colorado Springs, CO - Engine Emissions Estimate

Number of Engines:	24	
Engine Size (bhp) at 6,707 ft elevation: ^[11, 13]	3180	@ 1800 RPM
Maximum Annual Operating Hours:	99	(hrs/year)
Estimated Actual Operating Hours:	6	(engines tested 0.5 hr/month each month)
Diesel Sulfur Content (wt%):	0.0015	(15 ppm)
Diesel Heat Content (MMBtu/gal): ^[12]	0.137	(diesel heat value (BTU/lb) * diesel density (lb/gal) * 1 MMBtu/10 ⁶ BTU)
Engine Fuel Consumption (gal/hour): ^[11]	173.5	(fuel consumption rate at 100% load)
Engine Displacement (liters/cylinder): ^[11]	4.875	(based on 78 liters / 16 cylinders)
Engine Make/Model: ^[11]	Caterpillar / Model 3516C	
Engine Family: ^[11]	CCPXL78.1NZS (1st set of 6 engines); FCPXL78.1NZS (2nd set of 6 engines)	
Engine Model Year: ^[11]	2012 (1st set of 6 engines) and 2015 (2nd set of six engines)	
Hourly Heat Input Rate (MMBtu/hr):	23.77	(fuel consumption (gal/hr) * diesel heat content (MMBtu/gal))

Pollutant	Emission Factor (g/kw-hr)	Emission Factor ^[3] (g/hp-hr)	Emission Factor ^[4] (lb/MMBtu)	Emission Factor ^[5] (lb/hp-hr)	Emission Rate ^[6] (lb/hr)	Potential Emissions Per Engine ^[7] (tons/year)	Potential Emissions ALL Engines ^[8] (tons/year)	Estimated ACTUAL Emissions - Per Engine ^[9] (tons/year)	Estimated ACTUAL Emissions - ALL Engines ^[10] (tons/year)
NOx	-	4.79	-	0.01056	33.59	1.662	39.900	0.1008	2.418
CO	-	0.34	-	0.00074	2.36	0.117	2.807	0.0071	0.170
PM ^[11]	-	0.03	-	0.00008	0.24	0.012	0.290	0.0007	0.018
SO ₂	-	-	-	0.0000121	0.04	0.002	0.046	0.0001	0.003
VOC ^[2]	-	0.12	-	0.00027	0.85	0.042	1.006	0.0025	0.061
Formaldehyde	-	-	7.89E-05	0.00000	0.00	9.29E-05	2.23E-03	5.63E-06	1.35E-04
Acetaldehyde	-	-	2.52E-05	0.00000	0.00	2.97E-05	7.12E-04	1.80E-06	4.31E-05
Acrolein	-	-	7.88E-06	0.00000	0.00	9.27E-06	2.23E-04	5.62E-07	1.35E-05
Benzene	-	-	7.76E-04	0.00001	0.02	9.13E-04	2.19E-02	5.53E-05	1.33E-03
Toluene	-	-	2.81E-04	0.00000	0.01	3.31E-04	7.94E-03	2.00E-05	4.81E-04
Xylenes	-	-	1.93E-04	0.00000	0.00	2.27E-04	5.45E-03	1.38E-05	3.30E-04
Naphthalene	-	-	1.30E-04	0.00000	0.00	1.53E-04	3.67E-03	9.27E-06	2.23E-04

[1] It is assumed that all PM is PM2.5 or smaller (i.e., PM = PM10 = PM2.5)

[2] Emissions listed as HC (hydrocarbons) in manufacturer's data are assumed to be 100% VOC.

[3] Manufacturer's emissions data based on derated engine power (see "Altitude Corrections" worksheet).

[4] HAP emission factors from AP-42 Table 3.4-3 (lb/MMBtu) except for Naphthalene from Table 3.4-4 (lb/MMBtu)

[5] SO₂ EF derived from AP-42 Table 3.4-1 (lb/hp-hr) where S = 0.0015% (15 ppm). For NOx, CO, PM, and VOC: Emission Factor (lb/hp-hr) = Emission Factor (g/hp-hr) * 1 lb/453.6 g
For HAPs, Emission Factor (lb/hp-hr) = Emission Factor (lb/MMBtu) * Hourly heat input (MMBtu/hr) / Engine size (horsepower)

[6] Emission Rate (lb/hr) = Emission Factor (lb/hp-hr) * Derated engine power (hp)

[7] Potential emissions per engine (tons/year) = Emission Rate (lb/hr) * Maximum annual operating hours (hrs/year) / 2000 lb/ton

[8] Potential emissions ALL engines (tons/year) = Potential emissions per engine (tons/year) * Number of engines

[9] Estimated ACTUAL Emissions Per Engine (tons/year) = Emission Rate (lb/hr) * Estimate Actual Operating Hours (hrs/year) / 2000 lb/ton

[10] Estimated ACTUAL emissions for ALL engines (tons/year) = Estimated Actual Emissions Per Engine (tons/year) * Number of engines

[11] Engine specifications shown are for Caterpillar Model 3516C engines.

[12] Diesel fuel heat value derived from diesel properties in footnote "a" to AP-42 Table 3.4-1 (19,300 Btu/lb and 7.1 lb/gal)

[13] Based on Caterpillar engine power data provided for 3516C engines at elevation. See "Altitude Corrections" worksheet.

Assumptions:

1) Future engines will be similarly sized to the initial 12 engines and have emission levels that are no worse than that for the initial 12 engines

2) Future engines will also be used for emergency purposes only, > 3000 hp, and have a displacement < 10 liters/cylinder

In other words, future engines will be classified the same under 40 CFR Part 60, Subpart IIII.

Walmart Data Center - Colorado Springs, CO - Altitude Corrections

ENGINE POWER ALTITUDE DERATE

Maximum engine power at sea level (all temps): 3,634 BHP

Site Conditions:

Altitude: 6707 ft

*Ambient Operating Temperature: 70 F

* = All engines are located inside the building. Average room temperature of 70 F assumed.

Altitude Derated Engine Power:

Altitude	BHP ^[1] @ 70 F
6,000	3,270
6,707	x
7,000	3,142

x = maximum engine power at site conditions (i.e., derated engine power)

Using linear interpolation, $x = 3270 + [(3142 - 3270) * (6707 - 6000) / (7000 - 6000)]$

x = **3,180 BHP**

^[1] BHP data from "Altitude Corrected Power Capability (BHP)" table contained in Caterpillar's performance data document DM9228 for Caterpillar engine model 3516C.

Manufacturer's Emissions Data At Derated Power:

BHP	NOx ^[2]	CO ^[2]	VOC ^[2]	PM ^[2]
3,633	5.32	0.42	0.1	0.04
3,180	a	b	c	d
2,760	4.3	0.26	0.14	0.03

^[2] All emission rates in g/HP-hr. Emission rates at 100% load (3,633 BHP) and 75% load (2,760 BHP) taken from Caterpillar nominal emissions data table contained in performance document DM8266 for Caterpillar engine model 3516C.

Using linear interpolation:

a = NOx emission rate at derated engine power

a = $4.30 + [(5.32 - 4.30) * (3180 - 2760) / (3633 - 2760)]$

a = **4.79 g/HP-hr**

b = CO emission rate at derated engine power

b = $0.26 + [(0.42 - 0.26) * (3180 - 2760) / (3633 - 2760)]$

b = **0.34 g/HP-hr**

c = VOC emission rate at derated engine power

c = $0.14 + [(0.1 - 0.14) * (3180 - 2760) / (3633 - 2760)]$

c = **0.12 g/HP-hr**

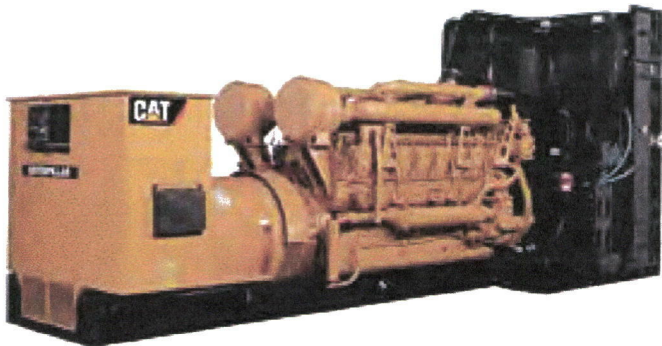
d = PM emission rate at derated engine power

d = $0.03 + [(0.04 - 0.03) * (3180 - 2760) / (3633 - 2760)]$

d = **0.03 g/HP-hr**



Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.



Specifications

Generator Set Specifications	
Voltage	220 to 13800 volts
Minimum Rating	1650 ekW (2500 kVA)
Maximum Rating	2500 ekW (2750 kVA)
Frequency	50 or 60 Hz
Speed	1500 or 1800 RPM

Generator Set Configurations	
Emissions/Fuel Strategy	EPA Certified for Stationary Emergency Application (Emits Equivalent U.S. EPA Tier 2 Nonroad Standards), Low Fuel Consumption

Engine Specifications		
Engine Model	3516C, ATAAC, V-16,4-Stroke Water-Cooled Diesel	
Bore	170 mm	6.69 in
Stroke (Std)	190 mm	7.48 in
Stroke (HD)	215 mm	8.46 in
Compression Ratio	14.7:1	
Aspiration	TA	
Governor Type	Adem™3	
Fuel System	Electronic unit injection	

Benefits And Features

Cat Diesel Engine

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke-cycle diesel engine combines consistent performance and excellent fuel economy with minimum weight

Generator

- Matched to the performance and output characteristics of Cat engines
- Industry leading mechanical and electrical design
- Industry leading motor starting capabilities
- High Efficiency

Cat EMCP Control Panel

The EMCP controller features the reliability and durability you have come to expect from your Cat equipment. EMCP4 is a scalable control platform designed to ensure reliable generator set operation, providing extensive information about power output and engine operation. EMCP4 systems can be further customized to meet your needs through programming and expansion modules.

Seismic Certification

- Seismic Certification available.
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength.
- IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer
- Seismic Certification per Applicable Building Codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007, CBC 2010
- Pre-approved by OSHPD and carries an OSP-0321-10 for use in healthcare projects in California

Design Criteria

The generator set accepts 100% rated load in one step per NFPA 110 and meets ISO 8528-5 transient response.

UL 2200 / CSA - Optional

- UL 2200 listed packages
- CSA Certified
- Certain restrictions may apply.
- Consult with your Cat® Dealer.

Single-Source Supplier

Fully prototype tested with certified torsional vibration analysis available

World Wide Product Support

Cat Dealers provide extensive post sale support including maintenance and repair agreements. Cat dealers have over 1,800 dealer branch stores operating in 200 countries. The Cat® SOSM program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products.

Standard Equipment**Air Inlet**

- Air Cleaner

Cooling

- Package mounted radiator

Exhaust

- Exhaust flange outlet

Fuel

- Primary fuel filter with integral water separator
- Secondary fuel filter
- Fuel priming pump

Generator

- Matched to the performance and output characteristics of Cat engines
- IP23 Protection

Power Termination

- Bus Bar

Control Panel

- EMCP 4 Genset Controller

General

- Paint - Caterpillar Yellow except rails and radiators gloss black

Optional Equipment**Exhaust**

- Exhaust mufflers

Generator

- Anti-condensation heater
- Excitation: [] Permanent Magnet Excited (PM) [] Internally Excited (IE)
- Oversize and premium generators

Power Termination

- Circuit breakers, UL listed
- Circuit breakers, IEC compliant

Control Panels

- EMCP (4.2) (4.3) (4.4)
- Generator temperature monitoring & protection
- Load share module
- Digital I/O module
- Remote monitoring software

Mounting

- Rubber anti-vibration mounts
- Spring-type vibration isolator
- IBC isolators

Starting/Charging

- Battery chargers
- Oversize batteries
- Jacket water heater
- Heavy-duty starting system
- Charging alternator
- Air starting motor with control and silencer

General

- The following options are based on regional and product configuration:
- Seismic Certification per applicable building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, CBC 2007
- UL 2200 package
- EU Certificate of Conformance (CE)
- CSA Certification
- EEC Declaration of Conformity
- Enclosures: sound attenuated, weather protective
- Automatic transfer switches (ATS)
- Integral & sub-base fuel tanks
- Integral & sub-base UL listed dual wall fuel tanks

The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, EUI, S•O•S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

3516C

2500 ekW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)

3516C

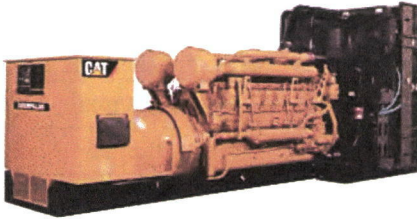
2500 ekW/ 3125 kVA
60 Hz/ 1800 rpm/ 12470 V

Image shown may not reflect actual configuration

Metric

English

Package Performance

Genset Power Rating with Fan @ 0.8 Power Factor	2500 ekW	
Genset Power Rating	3125 kVA	
Aftercooler (Separate Circuit)	N/A	N/A

Fuel Consumption

100% Load with Fan	656.8 L/hr	173.5 gal/hr
75% Load with Fan	510.8 L/hr	134.9 gal/hr
50% Load with Fan	372.4 L/hr	98.4 gal/hr
25% Load with Fan	219.3 L/hr	57.9 gal/hr

Cooling System¹

Engine Coolant Capacity	233.0 L	61.6 gal
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Inlet Air

Combustion Air Inlet Flow Rate	204.2 m ³ /min	7212.2 cfm
Max. Allowable Combustion Air Inlet Temp	50 ° C	122 ° F

Exhaust System

Exhaust Stack Gas Temperature	490.7 ° C	915.2 ° F
Exhaust Gas Flow Rate	554.5 m ³ /min	19578.8 cfm
Exhaust System Backpressure (Maximum Allowable)	6.7 kPa	27.0 in. water

ELECTRIC POWER - Technical Spec Sheet STANDARD



3516C

2500 kW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)

Heat Rejection

Heat Rejection to Jacket Water	826 kW	46992 Btu/min
Heat Rejection to Exhaust (Total)	2502 kW	142265 Btu/min
Heat Rejection to Aftercooler	786 kW	44723 Btu/min
Heat Rejection to Atmosphere from Engine	161 kW	9146 Btu/min
Heat Rejection to Atmosphere from Generator	107 kW	6079 Btu/min

Alternator²

Motor Starting Capability @ 30% Voltage Dip	4478 skVA
Current	145 amps
Frame Size	2770
Excitation	PM
Temperature Rise	130 ° C

Emissions (Nominal)³

NOx	2349.1 mg/Nm ³	5.3 g/hp-hr
CO	195.4 mg/Nm ³	0.4 g/hp-hr
HC	42.1 mg/Nm ³	0.1 g/hp-hr
PM	14.1 mg/Nm ³	0.0 g/hp-hr

DEFINITIONS AND CONDITIONS

1. For ambient and altitude capabilities consult your Cat dealer. Air flow restriction (system) is added to existing restriction from factory.
2. UL 2200 Listed packages may have oversized generators with a different temperature rise and motor starting characteristics. Generator temperature rise is based on a 40° C ambient per NEMA MG1-32.
3. Emissions data measurement procedures are consistent with those described in EPA CFR 40 Part 89, Subpart D & E and ISO8178-1 for measuring HC, CO, PM, NOx. Data shown is based on steady state operating conditions of 77° F, 28.42 in HG and number 2 diesel fuel with 35° API and LHV of 18,390 btu/lb. The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle.

3516C

2500 ekW/ 3125 kVA/ 60 Hz/ 1800 rpm/ 12470 V/ 0.8 Power Factor

Rating Type: STANDBY

**Emissions: EPA Certified for Stationary Emergency
Application (Emits Equivalent U.S. EPA Tier 2 Nonroad
Standards)**

Applicable Codes and Standards:

AS1359, CSA C22.2 No100-04, UL142, UL489, UL869, UL2200,
NFPA37, NFPA70, NFPA99, NFPA110, IBC, IEC60034-1, ISO3046, ISO8528,
NEMA MG1-22, NEMA MG1-33, 72/23/EEC, 98/37/EC, 2004/108/EC

Note: Codes may not be available in all model configurations. Please consult your local Cat Dealer representative for availability.

STANDBY: Output available with varying load for the duration of the interruption of the normal source power. Average power output is 70% of the standby power rating. Typical operation is 200 hours per year, with maximum expected usage of 500 hours per year.

Ratings are based on SAE J1349 standard conditions. These ratings also apply at ISO3046 standard conditions

Fuel Rates are based on fuel oil of 35° API [16° C (60° F)] gravity having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 29° C (85° F) and weighing 838.9 g/liter (7.001 lbs/U.S. gal.). Additional ratings may be available for specific customer requirements, contact your Cat representative for details. For information regarding Low Sulfur fuel and Biodiesel capability, please consult your Cat dealer.

www.Cat-ElectricPower.com

Performance No.: DM8266-04

Feature Code: 516DE8G

Generator Arrangement: 3111156

Date: 02/26/2015

Source Country: U.S.

The International System of Units (SI) is used in this publication. CAT, CATERPILLAR, their respective logos, ADEM, EUI, S•O•S, "Caterpillar Yellow" and the "Power Edge" trade dress, as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.

PERFORMANCE DATA[DM8266]

January 27, 2015

Performance Number: DM8266

Change Level: 04

SALES MODEL:	3516C
ENGINE POWER (BHP):	3,634
GEN POWER WITH FAN (EKW):	2,500.0
COMPRESSION RATIO:	14.7
RATING LEVEL:	STANDBY
PUMP QUANTITY:	2
FUEL TYPE:	DIESEL
MANIFOLD TYPE:	DRY
GOVERNOR TYPE:	ADEM3
ELECTRONICS TYPE:	ADEM3
CAMSHAFT TYPE:	STANDARD
IGNITION TYPE:	CI
INJECTOR TYPE:	EUI
FUEL INJECTOR:	2501368
REF EXH STACK DIAMETER (IN):	12
MAX OPERATING ALTITUDE (FT):	2,953

COMBUSTION:	DI
ENGINE SPEED (RPM):	1,800
HERTZ:	60
FAN POWER (HP):	130.1
ASPIRATION:	TA
AFTERCOOLER TYPE:	ATAAC
AFTERCOOLER CIRCUIT TYPE:	JW+OC, ATAAC
INLET MANIFOLD AIR TEMP (F):	122
JACKET WATER TEMP (F):	210.2
TURBO CONFIGURATION:	PARALLEL
TURBO QUANTITY:	4
TURBOCHARGER MODEL:	GT6041BN-48T-1.10
CERTIFICATION YEAR:	2006
CRANKCASE BLOWBY RATE (FT3/HR):	3,619.4
FUEL RATE (RATED RPM) NO LOAD (GAL/HR):	16.2
PISTON SPD @ RATED ENG SPD (FT/MIN):	2,539.4

INDUSTRY	SUBINDUSTRY	APPLICATION
ELECTRIC POWER	STANDARD	PACKAGED GENSET
OIL AND GAS	LAND PRODUCTION	PACKAGED GENSET

General Performance Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	BRAKE MEAN EFF PRES (BMEP)	BRAKE SPEC FUEL CONSUMPTN (BSFC)	VOL FUEL CONSUMPTN (VFC)	INLET MFLD PRES	INLET MFLD TEMP	EXH MFLD TEMP	EXH MFLD PRES	ENGINE OUTLET TEMP
EKW	%	BHP	PSI	LB/BHP-HR	GAL/HR	IN-HG	DEG F	DEG F	IN-HG	DEG F
2,500.0	100	3,633	336	0.334	173.5	78.1	121.9	1,235.6	67.6	915.2
2,250.0	90	3,283	303	0.335	157.1	71.3	119.4	1,190.0	61.3	881.2
2,000.0	80	2,935	271	0.339	142.3	64.3	116.9	1,158.9	55.3	864.0
1,875.0	75	2,760	255	0.342	134.9	60.7	115.8	1,145.6	52.3	858.5
1,750.0	70	2,586	239	0.346	127.6	57.0	114.7	1,133.3	49.3	854.6
1,500.0	60	2,237	207	0.354	113.0	49.5	112.7	1,112.4	43.2	851.2
1,250.0	50	1,889	174	0.365	98.4	41.3	111.0	1,091.8	36.8	850.7
1,000.0	40	1,547	143	0.373	82.5	31.4	109.4	1,061.5	29.3	856.6
750.0	30	1,203	111	0.385	66.2	21.7	107.9	1,010.3	22.1	848.2
625.0	25	1,029	95	0.394	57.9	17.2	107.2	968.3	18.7	831.1
500.0	20	854	79	0.403	49.2	12.7	106.4	902.0	15.5	796.1
250.0	10	497	46	0.441	31.3	4.8	104.1	700.7	9.8	647.3

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	COMPRESSOR OUTLET PRES	COMPRESSOR OUTLET TEMP	WET INLET AIR VOL FLOW RATE	ENGINE OUTLET WET EXH GAS VOL FLOW RATE	WET INLET AIR MASS FLOW RATE	WET EXH GAS MASS FLOW RATE	WET EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)	DRY EXH VOL FLOW RATE (32 DEG F AND 29.98 IN HG)
EKW	%	BHP	IN-HG	DEG F	CFM	CFM	LB/HR	LB/HR	FT3/MIN	FT3/MIN
2,500.0	100	3,633	85	466.7	7,212.2	19,578.8	32,046.3	33,260.4	7,001.7	6,362.4
2,250.0	90	3,283	78	443.0	6,831.8	17,980.7	30,219.3	31,318.8	6,593.0	6,013.7
2,000.0	80	2,935	70	417.8	6,404.5	16,560.6	28,284.6	29,277.2	6,151.5	5,625.4
1,875.0	75	2,760	66	404.7	6,173.3	15,893.2	27,261.3	28,202.4	5,928.1	5,427.1
1,750.0	70	2,586	63	391.2	5,929.9	15,232.6	26,196.0	27,086.8	5,698.4	5,222.0
1,500.0	60	2,237	55	363.5	5,411.9	13,879.0	23,947.5	24,739.5	5,205.5	4,779.1
1,250.0	50	1,889	46	334.6	4,843.3	12,413.0	21,444.3	22,133.2	4,657.5	4,283.2
1,000.0	40	1,547	36	297.5	4,121.4	10,609.5	18,262.0	18,840.0	3,963.0	3,647.2
750.0	30	1,203	25	249.8	3,423.0	8,763.8	15,175.3	15,640.3	3,294.6	3,037.8
625.0	25	1,029	21	223.4	3,104.6	7,844.6	13,765.1	14,171.8	2,988.1	2,760.8
500.0	20	854	16	197.2	2,791.2	6,823.5	12,376.2	12,722.2	2,671.7	2,476.1
250.0	10	497	7	152.3	2,237.9	4,800.2	9,917.6	10,136.8	2,132.0	1,999.8

Heat Rejection Data

GENSET POWER WITH FAN	PERCENT LOAD	ENGINE POWER	REJECTION TO JACKET WATER	REJECTION TO ATMOSPHERE	REJECTION TO EXH	EXHAUST RECOVERY TO 350F	FROM OIL COOLER	FROM AFTERCOOLER	WORK ENERGY	LOW HEAT VALUE ENERGY	HIGH HEAT VALUE ENERGY
EKW	%	BHP	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN	BTU/MIN
2,500.0	100	3,633	46,992	9,146	142,265	79,907	19,835	44,723	154,077	372,403	396,702
2,250.0	90	3,283	44,242	8,557	127,929	70,449	17,960	39,380	139,243	337,204	359,207
2,000.0	80	2,935	41,477	8,182	116,879	63,561	16,262	34,167	124,444	305,311	325,233
1,875.0	75	2,760	40,076	8,007	111,588	60,518	15,425	31,612	117,053	289,608	308,505
1,750.0	70	2,586	38,657	7,874	106,293	57,637	14,588	29,085	109,651	273,881	291,752
1,500.0	60	2,237	35,755	7,684	95,729	52,220	12,915	24,201	94,874	242,485	258,307
1,250.0	50	1,889	32,626	7,527	85,184	46,626	11,245	19,401	80,109	211,118	224,893
1,000.0	40	1,547	29,235	7,262	72,693	40,153	9,427	13,873	65,583	176,995	188,544
750.0	30	1,203	25,476	6,784	59,425	32,726	7,565	8,706	51,005	142,037	151,305
625.0	25	1,029	23,394	6,435	52,542	28,568	6,621	6,496	43,653	124,317	132,429
500.0	20	854	21,006	5,995	44,739	23,683	5,624	4,534	36,223	105,594	112,484
250.0	10	497	15,737	5,026	27,795	12,371	3,578	1,916	21,071	67,181	71,564

Emissions Data

RATED SPEED POTENTIAL SITE VARIATION: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	22,948	14,101	7,004	3,568	3,185
TOTAL CO	G/HR	2,726	1,304	1,092	1,496	2,098
TOTAL HC	G/HR	500	499	543	408	437
PART MATTER	G/HR	185.5	123.7	132.1	139.5	141.0
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,818.9	2,229.5	1,544.3	1,352.7	2,230.2
TOTAL CO	(CORR 5% O2) MG/NM3	351.8	213.9	252.3	594.6	1,552.7
TOTAL HC	(CORR 5% O2) MG/NM3	55.9	72.8	108.8	140.7	282.4
PART MATTER	(CORR 5% O2) MG/NM3	19.7	16.5	25.8	48.5	88.2
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,373	1,086	752	659	1,086
TOTAL CO	(CORR 5% O2) PPM	281	171	202	476	1,242
TOTAL HC	(CORR 5% O2) PPM	104	136	203	263	527
TOTAL NOX (AS NO2)	G/HP-HR	6.38	5.15	3.74	3.50	6.47
TOTAL CO	G/HP-HR	0.76	0.48	0.58	1.47	4.26
TOTAL HC	G/HP-HR	0.14	0.18	0.29	0.40	0.89
PART MATTER	G/HP-HR	0.05	0.05	0.07	0.14	0.29
TOTAL NOX (AS NO2)	LB/HR	50.59	31.09	15.44	7.87	7.02
TOTAL CO	LB/HR	6.01	2.88	2.41	3.30	4.62
TOTAL HC	LB/HR	1.10	1.10	1.20	0.90	0.96
PART MATTER	LB/HR	0.41	0.27	0.29	0.31	0.31

RATED SPEED NOMINAL DATA: 1800 RPM

GENSET POWER WITH FAN	EKW	2,500.0	1,875.0	1,250.0	625.0	250.0
PERCENT LOAD	%	100	75	50	25	10
ENGINE POWER	BHP	3,633	2,760	1,889	1,029	497
TOTAL NOX (AS NO2)	G/HR	19,123	11,751	5,837	2,974	2,654
TOTAL CO	G/HR	1,515	725	607	831	1,165
TOTAL HC	G/HR	376	375	408	307	329
TOTAL CO2	KG/HR	1,740	1,340	966	559	296
PART MATTER	G/HR	132.5	88.4	94.3	99.6	100.7
TOTAL NOX (AS NO2)	(CORR 5% O2) MG/NM3	2,349.1	1,857.9	1,286.9	1,127.3	1,858.5
TOTAL CO	(CORR 5% O2) MG/NM3	195.4	118.8	140.1	330.3	862.6
TOTAL HC	(CORR 5% O2) MG/NM3	42.1	54.8	81.8	105.8	212.3
PART MATTER	(CORR 5% O2) MG/NM3	14.1	11.8	18.4	34.7	63.0
TOTAL NOX (AS NO2)	(CORR 5% O2) PPM	1,144	905	627	549	905
TOTAL CO	(CORR 5% O2) PPM	156	95	112	264	690
TOTAL HC	(CORR 5% O2) PPM	79	102	153	197	396
TOTAL NOX (AS NO2)	G/HP-HR	5.32	4.30	3.12	2.92	5.39
TOTAL CO	G/HP-HR	0.42	0.26	0.32	0.82	2.37
TOTAL HC	G/HP-HR	0.10	0.14	0.22	0.30	0.67
PART MATTER	G/HP-HR	0.04	0.03	0.05	0.10	0.20
TOTAL NOX (AS NO2)	LB/HR	42.16	25.91	12.87	6.56	5.85
TOTAL CO	LB/HR	3.34	1.60	1.34	1.83	2.57
TOTAL HC	LB/HR	0.83	0.83	0.90	0.68	0.72
TOTAL CO2	LB/HR	3,836	2,955	2,130	1,233	654
PART MATTER	LB/HR	0.29	0.19	0.21	0.22	0.22
OXYGEN IN EXH	%	9.4	10.4	11.3	12.2	14.4
DRY SMOKE OPACITY	%	1.7	1.4	1.9	2.5	3.8
BOSCH SMOKE NUMBER		0.58	0.49	0.62	0.92	1.27

Regulatory Information

EPA TIER 2		2006 - 2010		
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY			2011 - —	
GASEOUS EMISSIONS DATA MEASUREMENTS PROVIDED TO THE EPA ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. THE "MAX LIMITS" SHOWN BELOW ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE EMERGENCY STATIONARY REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634
1,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,625	3,563	3,634
2,000	3,634	3,634	3,634	3,634	3,634	3,614	3,551	3,490	3,430	3,634
3,000	3,634	3,634	3,634	3,607	3,542	3,478	3,417	3,358	3,301	3,634
4,000	3,634	3,604	3,536	3,470	3,407	3,346	3,288	3,231	3,176	3,574
5,000	3,534	3,466	3,401	3,338	3,277	3,218	3,162	3,107	3,055	3,461
6,000	3,398	3,332	3,270	3,209	3,151	3,094	3,040	2,987	2,937	3,351
7,000	3,266	3,203	3,142	3,084	3,028	2,974	2,922	2,871	2,823	3,243
8,000	3,137	3,077	3,019	2,963	2,909	2,857	2,807	2,758	2,712	3,137
9,000	3,013	2,955	2,899	2,845	2,794	2,744	2,696	2,649	2,604	3,034
10,000	2,892	2,837	2,783	2,732	2,682	2,634	2,588	2,543	2,500	2,933
11,000	2,776	2,722	2,671	2,621	2,574	2,528	2,483	2,441	2,399	2,835
12,000	2,663	2,611	2,562	2,515	2,469	2,425	2,382	2,341	2,301	2,739
13,000	2,553	2,504	2,457	2,411	2,367	2,325	2,284	2,245	2,207	2,645
14,000	2,447	2,400	2,354	2,311	2,269	2,228	2,189	2,151	2,115	2,554
15,000	2,344	2,299	2,256	2,214	2,174	2,135	2,097	2,061	2,026	2,465



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2015 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT OF 1990

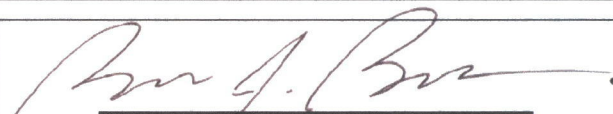
OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: **FCPXL78.1NZS-002**

Effective Date:
07/01/2014

Expiration Date:
12/31/2015


Byron J. Bunker, Division Director
Compliance Division

Issue Date:
07/01/2014

Revision Date:
N/A

Model Year: 2015

Manufacturer Type: Original Engine Manufacturer

Engine Family: FCPXL78.1NZS

Mobile/Stationary Indicator: Stationary

Emissions Power Category: 560<kW<=2237

Fuel Type: Diesel

After Treatment Devices: No After Treatment Devices Installed

Non-after Treatment Devices: Electronic Control, Engine Design Modification

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

**COOLING TOWER EMISSIONS CALCULATIONS
AND SUPPORTING DOCUMENTATION**

Description of Source

Cooling Tower 001 & 002 are each a single tower and each are comprised of four cells. Each tower is based on an induced draft/counterflow configuration. Each tower provides cooling for heat loads generated by mechanical, computer & electrical equipment.

Basis of Calculations

Annual Operation	=	8,760	hrs/year		
Drift Loss Rate	=	0.0010%	of Cooling Water Circulation Rate		
Cooling water flow rate	=	12,000	gpm - per tower		
or	=	3,000	gpm - per cell	or	720,000 gph - per tower
Average TDS concentration	=	519.92	mg/L / ppm		
Maximum TDS concentration	=	779.88	mg/L (calculated as 150% of Average TDS)		

- [1] Ratio (inferred avg.) of total Cooling Tower Circulation Rate per individual cell, based on 12,000 gpm total
- [2] TDS (ppm) = Conductivity: $\mu\text{S}/\text{cm} \times 0.67$. A value of 0.67 is commonly used as an approximation if the actual factor is not known.
- [3] Manufacturer provided drift loss for this tower configuration confirmed as 0.0010%.
- [4] Total Drift (lb/gal) = (MaxTDS (mg/L) * 3.79 L/gal) / (454 g/lb * 1000 mg/g)
- [5] Total Drift (lb/hr) = CT Circ rate (gal/min) * Drift (%) * 60 min/hr * Total drift (lb/gal); based on assumption all drift solids are within PM₁₀ range
- [6] Hours of operation per USEPA's AP42 for cooling towers set at 8760 hours
- [7] PM₁₀ Annual Emissions (ton/yr) = (Total Drift (lb/hr) * Annual Hrs of Operation (hr/yr)) / 2000 lb/ton
- [8] For this analysis all PM₁₀ is conservatively assumed to be PM_{2.5}
- [9] Maximum TDS is input as 150% of Average (Actual) - "Maximum" will be considered 'Permit Request Level' per APENs

Sanitary Discharge Preview - Project Specific Estimation based on Local Water Study and SPX Cooling Tower Characteristics

Total Hardness	208	ppm		
Conductivity	776	$\mu\text{S}/\text{cm}$	→	519.92 ppm [Converted at 0.67 ratio]
Turbidity	0.32	NTU		
Silica	31.52	ppm		
Total Alkalinity	216	ppm		

Projected 'Average' TDS Measure - Cooling Tower Discharge Waters 519.92 ppm

Estimated Emissions - "ACTUAL" or Anticipated Operational Level

		Cooling Water Circulation Rate (gal/min) ^[1]	Average Total Dissolved Solids (mg/L) ^[2]	Drift (%) ^[3]	Total Drift (lb/gal) ^[4]	Total Drift Factor (lb/hr) ^[5]	Annual Hours of Operation (hrs/yr) ^[6]
TOWER 1	Cell-001	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-002	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-003	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-004	3,000	519.92	0.0010%	0.004	0.008	8760

SUB-TOTAL (Phase 1)

TOWER 2	Cell-001	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-002	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-003	3,000	519.92	0.0010%	0.004	0.008	8760
	Cell-004	3,000	519.92	0.0010%	0.004	0.008	8760

SUB-TOTAL (Phase 2)

AVERAGE ("ACTUAL") EMISSIONS - TOTAL BUILD OUT

ANTICIPATED OPERATIONAL LEVEL "ACTUAL" PM ₁₀ (ton/yr) ^[7]	ANTICIPATED OPERATIONAL LEVEL "ACTUAL" PM _{2.5} (ton/yr) ^[8]
0.034	0.034
0.034	0.034
0.034	0.034
0.034	0.034
0.137	0.137
0.034	0.034
0.034	0.034
0.034	0.034
0.034	0.034
0.137	0.137
0.27	0.27

		Cooling Water Circulation Rate (gal/min) ^[1]	Maximum Total Dissolved Solids (mg/L) ^[9]	Drift (%) ^[3]	Total Drift (lb/gal) ^[4]	Total Drift Factor (lb/hr) ^[5]	Annual Hours of Operation (hrs/yr) ^[6]
TOWER 1	Cell-001	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-002	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-003	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-004	3,000	779.88	0.0010%	0.007	0.012	8760

SUB-TOTAL (Phase 1)

TOWER 2	Cell-001	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-002	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-003	3,000	779.88	0.0010%	0.007	0.012	8760
	Cell-004	3,000	779.88	0.0010%	0.007	0.012	8760

SUB-TOTAL (Phase 2)

MAXIMUM ("PTE") EMISSIONS - TOTAL BUILD OUT

Requested Permit Level under APEN Application:

MAXIMUM OPERATIONAL LEVEL "PTE" PM ₁₀ (ton/yr) ^[7]
0.051
0.051
0.051
0.051
0.205

MAXIMUM OPERATIONAL LEVEL "PTE" PM _{2.5} (ton/yr) ^[8]
0.051
0.051
0.051
0.051
0.205

0.051
0.051
0.051
0.051
0.205

0.051
0.051
0.051
0.051
0.205

0.41

0.41

0.41 TPY (PM₁₀)

0.41 TPY (PM_{2.5})



KETTLE CREEK DATACENTER

Colorado Springs, Colorado

System Average Load: 2,611 Tons

Average Recirculation Rate: **7,833** gpm

Average Evaporation Rate: **66.6** gpm

Incoming Water (Make-up)	GPM	GPD	GPY	Feet ³ / Yr.	Water Rate Nov.-Apr. (\$/CFT)	Water Rate May-Oct. (\$/CFT)	Annual Cost
Cycles of Concentration							
8.0	76.1	109,572	39,993,955	5,332,527	\$0.0248	\$0.0464	\$189,837.97

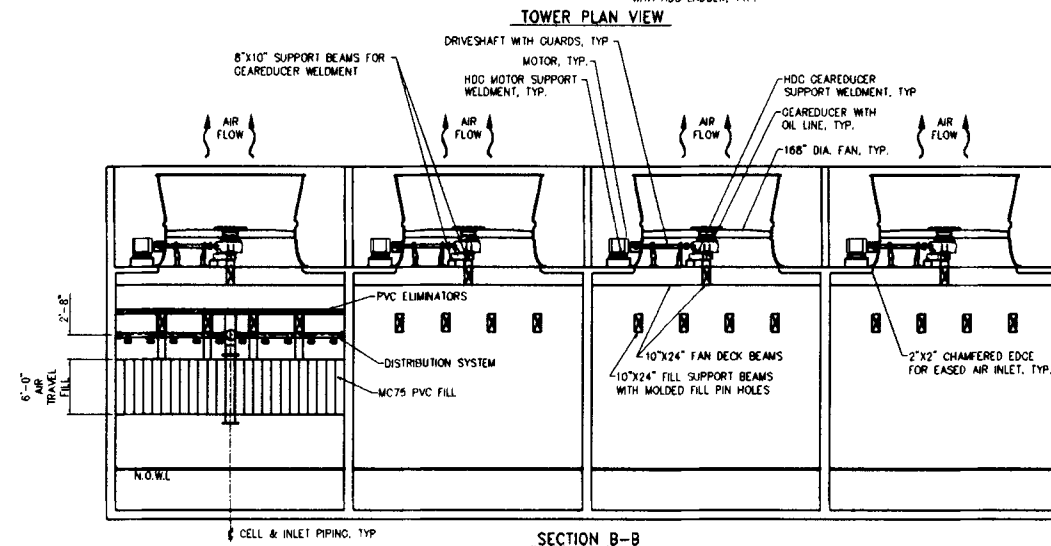
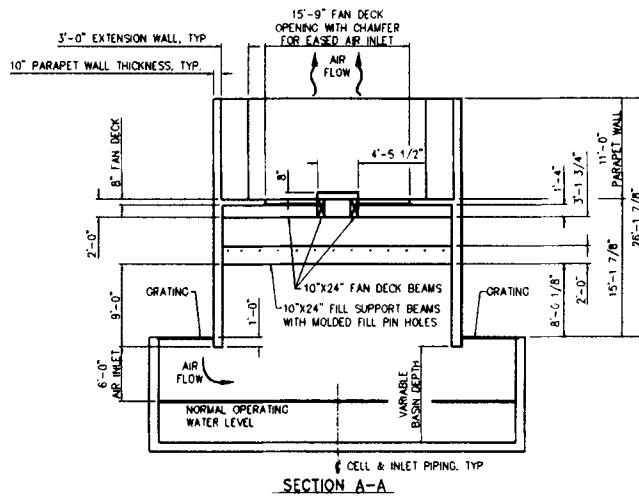
Sanitary Discharge	GPM	GPD	GPY	Feet ³ / Yr.	Water Rate (\$/CFT)	Annual Cost
Cycles of Concentration						
8.0	9.5	13,697	4,999,244	666,566	\$0.0262	\$17,464.03

WATER QUALITY

	<u>City Water Make-up</u>	
Total Hardness	26	ppm
Conductivity	97	US/cm
Turbidity	0.04	NTU
Silica	3.94	ppm
Total Alkalinity	27	ppm

	<u>Sanitary Discharge</u>	
Total Hardness	208	ppm
Conductivity	776	US/cm
Turbidity	0.32	NTU
Silica	31.52	ppm
Total Alkalinity	216	ppm

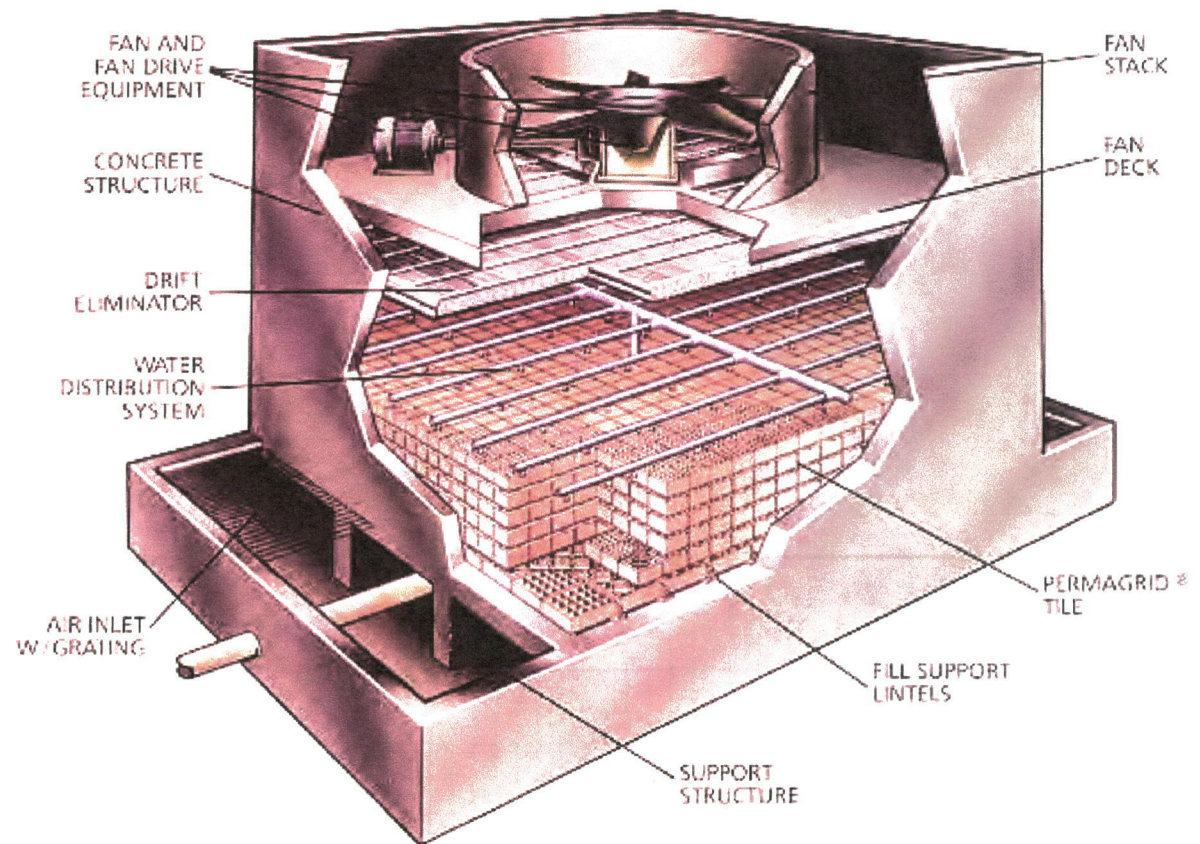
- 1) ALL INTERNAL COMPONENTS TO BE SUPPLIED BY SPX CT, UNLESS NOTED.
- 2) BASIN OUTLET, MAKE UP AND OVERFLOW ARE BY OTHERS.
- 3) CUSTOMER TO PROVIDE FINAL STRUCTURE ARRANGEMENT AND ALL CONCRETE DIMENSIONS FOR SPX CT DESIGN REVIEW.
- 4) DESIGN AND DRAWINGS OF CONCRETE STRUCTURE IS BY OTHERS. MATERIALS AND LABOR FOR CONCRETE STRUCTURE IS BY OTHERS. ALL CONCRETE IS BY OTHERS.
- 5) CONCRETE STRUCTURE WALL THICKNESSES AND DIMENSIONS SHOWN ARE FOR EXAMPLE ONLY. FINAL WALL OR SLAB THICKNESS AND SUPPORT MEMBER SIZES ARE TO BE DETERMINED BY THE CONCRETE STRUCTURE ENGINEER. CERTAIN MINIMUM WALL AND STRUCTURE DIMENSIONS WILL NEED TO BE SPECIFIED BY SPX CT ENGINEERING FOR PROPER FIT-UP OF EQUIPMENT AND FOR PERFORMANCE.

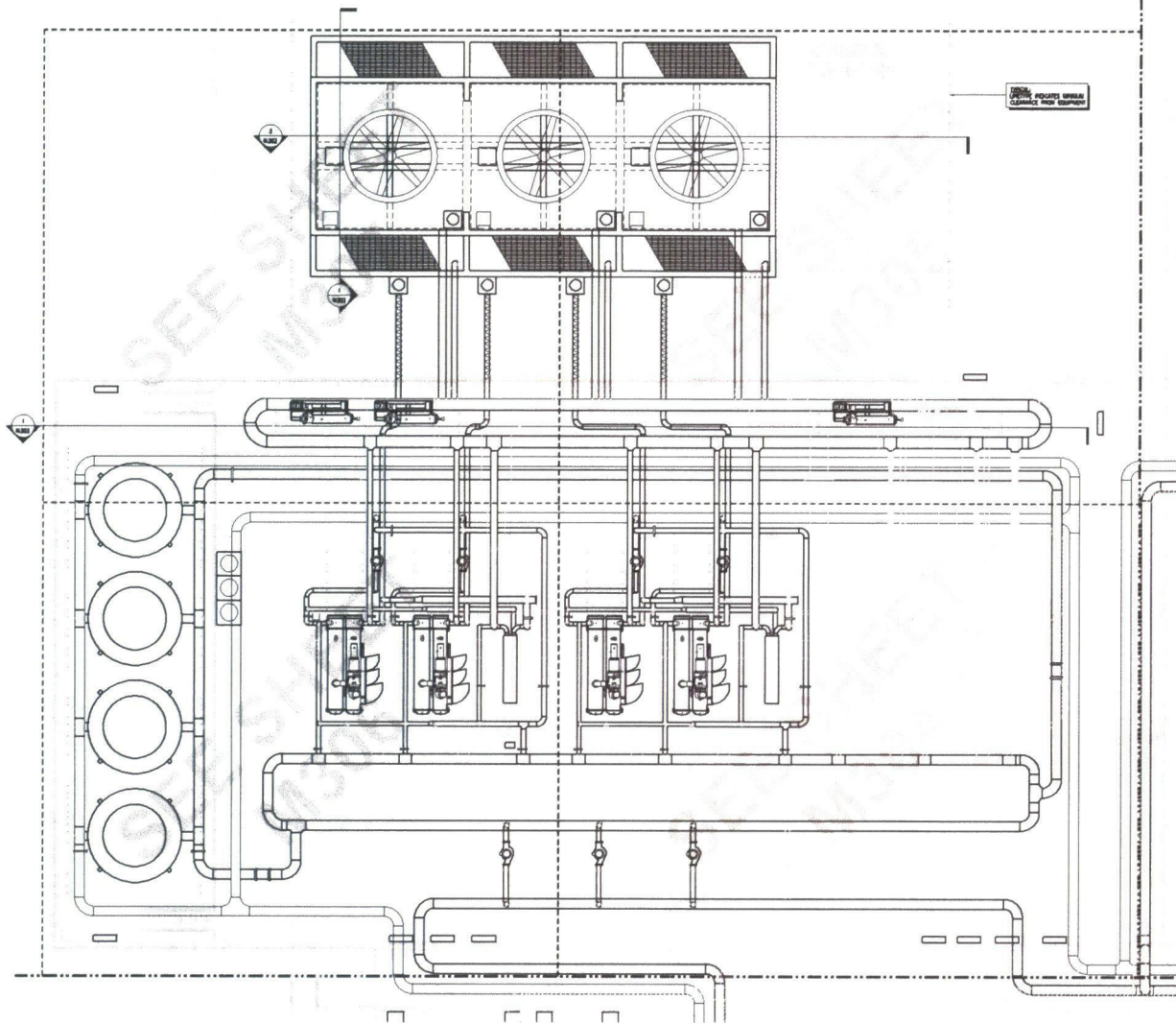


				SECURITY INFORMATION			
NAME	DOB	CLASS	STATUS	SECURITY NUMBER	FLY	SECURITY NUMBER	SEC
WIFE	08/12/2011	KAC	KAC	B28586	1=80	2011-4329	

■ Tower Anatomy

- Shown with ceramic tile fill





SEE SPECIFICATIONS FOR
EQUIPMENT SIZES
AND MATERIALS



CORGAN ASSOCIATES, INC.
20 ALPINE DRIVE
DALLAS, TX 75201
TEL: (214) 748-2000
FAX: (214) 748-2001

MILLER ENGINEERING
ENGINEERING & ARCHITECTURE
811 EAST WISCONSIN AVENUE
MILWAUKEE, WISCONSIN 53202
WWW.MILLER-ENGINEERING.COM
TELEPHONE: (866) 347-1877
FAX: (414) 347-1877

ISSUES

1	ISSUE 1: SUBMITTAL DESIGN
2	ISSUE 2: SUBMITTAL DESIGN
3	ISSUE 3: SUBMITTAL DESIGN
4	ISSUE 4: SUBMITTAL DESIGN
5	ISSUE 5: SUBMITTAL DESIGN
6	ISSUE 6: SUBMITTAL DESIGN
7	ISSUE 7: SUBMITTAL DESIGN
8	ISSUE 8: SUBMITTAL DESIGN
9	ISSUE 9: SUBMITTAL DESIGN
10	ISSUE 10: SUBMITTAL DESIGN

REVISIONS

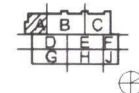
1	REVISION 1: SUBMITTAL DESIGN
2	REVISION 2: SUBMITTAL DESIGN
3	REVISION 3: SUBMITTAL DESIGN
4	REVISION 4: SUBMITTAL DESIGN
5	REVISION 5: SUBMITTAL DESIGN
6	REVISION 6: SUBMITTAL DESIGN
7	REVISION 7: SUBMITTAL DESIGN
8	REVISION 8: SUBMITTAL DESIGN
9	REVISION 9: SUBMITTAL DESIGN
10	REVISION 10: SUBMITTAL DESIGN



KETTLE CREEK DATA CENTER

10625 FEDERAL DRIVE
COLORADO SPRINGS, COLORADO

KEYPLAN



MECHANICAL PIPING PLAN AREA A

JOB 7142
DATE 10/28/2011
SHEET

M201A

KEYED NOTES

GENERAL NOTES

1. ALL EXISTING CONCRETE WATER PIPES SHALL BE REPLACED WITH 12" DIA. 150 LB. PIPE.

1. MECHANICAL PIPING PLAN - AREA A
100' = 1'-0"

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

EXISTING CONSTRUCTION PERMIT
PERMIT 12EP1155

STATE OF COLORADO

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
AIR POLLUTION CONTROL DIVISION
TELEPHONE: (303) 692-3150



CONSTRUCTION PERMIT

PERMIT NO: **12EP1155**

Initial Approval

DATE ISSUED: **APR 26 2012**

ISSUED TO: **Wal-Mart Stores, Inc.**

THE SOURCE TO WHICH THIS PERMIT APPLIES IS DESCRIBED AND LOCATED AS FOLLOWS:

Data center facility, known as the Colorado Data Center - Facility #7497, located at 10625 Federal Drive, Colorado Springs, in El Paso County, Colorado.

THE SPECIFIC EQUIPMENT OR ACTIVITY SUBJECT TO THIS PERMIT INCLUDES THE FOLLOWING:

Facility Equipment ID	AIRS Point	Description
GEN #1 through GEN #24	001 - 024	Twenty-four (24) Diesel powered emergency electric generators Make: Caterpillar Model: 3516C Serial Numbers: TBD 3,634 horsepower Manufacture date: 2012 Displacement: 4.875 L/cyl Date of entry into Colorado: Engines purchased new therefore, date of entry into CO is considered to be manufacture date. These engines are subject to NSPS IIII Tier 2 Standards Engines will be installed in phases. Generators #1 - #6 will meet the above description, while the generators identified in subsequent phases (Generators #7 - #24) will be reported to the Division for permit modification prior to installation.

THIS PERMIT IS GRANTED SUBJECT TO ALL RULES AND REGULATIONS OF THE COLORADO AIR QUALITY CONTROL COMMISSION AND THE COLORADO AIR POLLUTION PREVENTION AND CONTROL ACT C.R.S. (25-7-101 et seq), TO THOSE GENERAL TERMS AND CONDITIONS INCLUDED IN THIS DOCUMENT AND THE FOLLOWING SPECIFIC TERMS AND CONDITIONS:

REQUIREMENTS TO SELF-CERTIFY FOR FINAL APPROVAL

1. **YOU MUST** notify the Air Pollution Control Division (the Division) no later than fifteen days after commencement of the permitted operation or activity **by submitting a Notice of Startup form to the Division for the engines in each phase of the project.** The Notice of Startup form may be downloaded online at www.cdphe.state.co.us/ap/downloadforms.html. Failure to notify the Division of startup of the permitted source is a violation of Air Quality Control Commission (AQCC) Regulation No. 3, Part B, Section III.G.1 and can result in the revocation of the permit.
2. Within one hundred and eighty days (180) after commencement of operation of each phase of engines, compliance with the conditions contained on this permit shall be demonstrated to the Division. It is the permittee's responsibility to self certify compliance with the conditions. Failure to demonstrate compliance within 180 days may result in revocation of the permit or enforcement action by the Division. Information on how to certify compliance was mailed with the permit or can be obtained from the Division. (Reference: Regulation No. 3, Part B, II.G.2)
3. This permit shall expire if the owner or operator of the source for which this permit was issued: (i) does not commence construction/modification or operation of GEN #1 - 6 within 18 months after the date of issuance of this construction permit, does not commence construction/modification or operation of GEN #7 - 12 within 18 months after January 1, 2014, does not commence construction/modification or operation of GEN #13 - 18 within 18 months after January 1, 2016, does not commence construction/modification or operation of GEN #19 - 24 within 18 months after January 1, 2020; (ii) discontinues construction for a period of eighteen months or more; (iii) does not complete construction within a reasonable time of the estimated completion date. The Division may grant extensions of the deadline per Regulation No. 3, Part B, III.F.4.b. (Reference: Regulation No. 3, Part B, III.F.4.)
4. Within one hundred and eighty days (180) after commencement of operation of each phase of engines, the operator shall complete all initial compliance testing and sampling as required in this permit and submit the results to the Division as part of the self-certification process. (Reference: Regulation No. 3, Part B, Section III.E.)
5. Within one hundred and eighty days (180) after commencement of operation, the AIRS ID number shall be marked on the subject equipment for ease of identification. (Reference: Regulation No. 3, Part B, III.E.) (State only enforceable)
6. The serial numbers of the subject equipment shall be provided to the Division within fifteen days (15) after commencement of operation of each phase of engines. This information shall be included on the Notice of Startup (NOS) submitted for the equipment. (Reference: Regulation No. 3, Part B, III.E.)

EMISSION LIMITATIONS AND RECORDS

7. Emissions of air pollutants shall not exceed the following limitations (as calculated using the emission factors included in the Notes to Permit Holder section of this permit). Hourly and monthly records of the actual emission rates shall be maintained by the applicant and made available to the Division for inspection upon request. (Reference: Regulation No. 3, Part B, Section II.A.4)

Hourly Limits:

Facility Equipment ID	AIRS Point	Pounds per Hour	Emission Type
		NO _x	
GEN #1 - 6	001 - 006	181.5	Point
GEN #7 - 12	007 - 012	181.5	Point
GEN #13 - 18	013 - 018	181.5	Point
GEN #19 - 24	019 - 024	181.5	Point
TOTAL		726.0	

Annual Limits:

Facility Equipment ID	AIRS Point	Tons per Year	Emission Type
		NO _x	
GEN #1 - 6	001 - 006	9.1	Point
GEN #7 - 12	007 - 012	9.1	Point
GEN #13 - 18	013 - 018	9.1	Point
GEN #19 - 24	019 - 024	9.1	Point
TOTAL		36.3	

Emissions of air pollutants on an annual basis shall be found using the following formula:

$$Emissions_{Annual} = \frac{[Emission\ Factor\ (lb/hr) * Hours\ of\ Operation(hr/yr)]}{(2000lb/1\ ton)}$$

Emission factors used to calculate limits shall be those found in "Notes to Permit Holder #3".

During the first twelve (12) months of operation, compliance with both the hourly and yearly emission limitations shall be required. After the first twelve (12) months of operation, compliance with only the yearly limitation shall be required.

Compliance with the annual limits shall be determined by calculating the facility's annual criteria pollutant emissions, (including all HAPs above the de-minimis reporting level) from each emission unit, on a rolling (12) month total. By the end of each month a new twelve-month total shall be calculated based on the previous twelve months' data. The permit holder shall calculate monthly emissions and keep a compliance record on site, or at a local field office with site responsibility, for Division review. This rolling twelve-month total shall apply to all emission units, requiring an APEN, at this facility.

PROCESS LIMITATIONS AND RECORDS

8. This source shall be limited to the following maximum consumption, processing and/or operational rates as listed below. Monthly records of the actual process rate shall be maintained

by the applicant and made available to the Division for inspection upon request. (Reference: Regulation 3, Part B, II.A.4)

Process/Consumption Limits

Facility Equipment ID	AIRS Point	Process Parameter	Annual Limit
GEN #1 - 24	001 - 024	Hours of Operation	100 hr/yr each

Compliance with these consumption limits will be demonstrated by installing a non-resettable hour meter on the engine and recording the hours of the engine's operation.

Compliance with the yearly process limits shall be determined on a rolling twelve (12) month total. By the end of each month a new twelve-month total is calculated based on the previous twelve months' data. The permit holder shall calculate monthly process rate and keep a compliance record on site or at a local field office with site responsibility, for Division review.

STATE AND FEDERAL REGULATORY REQUIREMENTS

9. Visible emissions shall not exceed twenty percent (20%) opacity during normal operation of the source. During periods of startup, process modification, or adjustment of control equipment visible emissions shall not exceed 30% opacity for more than six minutes in any sixty consecutive minutes. Opacity shall be determined using EPA Method 9. (Reference: Regulation No. 1, Section II.A.1. & 4.)
10. This source is subject to the odor requirements of Regulation No. 2. (State only enforceable)
11. This source is subject to the New Source Performance Standards requirements of Regulation No. 6, Part A, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE) including, but not limited to, the following:
 - a. Emissions of Non-Methane Hydrocarbons and Nitrogen Oxides combined shall not exceed 4.8 grams per horsepower hour.
 - b. Emissions of Carbon Monoxide shall not exceed 2.6 grams per horsepower hour.
 - c. Emissions of Particulate Matter shall not exceed 0.15 grams per horsepower hour.
 - d. All fuel purchased shall meet the following specifications:
 - (1) Sulfur content shall not exceed 15 ppm.
 - (2) Have a minimum cetane index of 40 or
Have a maximum aromatic compound content of 35% by volume.

Compliance shall be demonstrated by maintaining copies of the fuel specifications provided by the supplier on-site or in a readily accessible location and made available to the Division for inspection upon request.

- e. All engines and control devices must be installed, configured, operated, and maintained according to the specifications and instructions provided by the engine manufacturer.
 - f. If engine is equipped with a diesel particulate filter, the filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. Records shall be kept of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit is approached.
 - g. A non-resettable hour meter must be installed prior to start-up. (Reference: NSPS III, § 60.4209 (a))
 - h. These engines shall not be used for any purpose except emergency power generation and for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of emergency stationary ICE in emergency situations. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Emergency stationary ICE may operate up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing. The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply non-emergency power as part of a financial arrangement with another entity. For owners and operators of emergency engines, any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as permitted in this section, is prohibited. (Reference: NSPS III, § 60.4211 (f))
12. The following requirements of Regulation No. 6, Part A, Subpart A, General Provisions, apply.
- a. At all times, including periods of start-up, shutdown, and malfunction, the facility and control equipment shall, to the extent practicable, be maintained and operated in a manner consistent with good air pollution control practices for minimizing emissions. Determination of whether or not acceptable operating and maintenance procedures are being used will be based on information available to the Division, which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. (Reference: Regulation No. 6, Part A. General Provisions from 40 CFR 60.11)
 - b. No article, machine, equipment or process shall be used to conceal an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere. (§ 60.12)

- c. Written notification of construction and initial startup dates shall be submitted to the Division as required under § 60.7.
- d. Records of startups, shutdowns, and malfunctions shall be maintained, as required under § 60.7.

OPERATING & MAINTENANCE REQUIREMENTS

- 13. Within one hundred and eighty days (180) after issuance of this permit, the applicant shall submit to the Division for approval an operating and maintenance plan for all control equipment and control practices, and a proposed recordkeeping format that will outline how the applicant will maintain compliance on an ongoing basis with the requirements of the "EMISSION LIMITATIONS AND RECORDS" section listed above. Compliance with the operating and maintenance plan shall commence at startup. (Reference: Regulation No. 3, Part B, Section III.G.7.) Failure to submit an acceptable operating and maintenance plan could result in denial of the final approval permit.

COMPLIANCE TESTING AND SAMPLING

Initial Testing Requirements

- 14. Within 180 days of startup of each phase of engines, the owner or operator shall demonstrate compliance with Condition 9, using EPA Method 9 to measure opacity from the engines. This measurement shall consist of a minimum twenty-four consecutive readings taken at fifteen second intervals over a 6 minute period. (Reference: Regulation No. 1, Section II.A.1 & 4)

Periodic Testing Requirements

- 15. No periodic testing is required for this source.

ADDITIONAL REQUIREMENTS

- 16. The AIRS ID number shall be marked on the subject equipment for ease of identification. (Reference: Regulation No. 3, Part B, III.E.) (State only enforceable)
- 17. A revised Air Pollutant Emission Notice (APEN) shall be filed: (Reference: Regulation No. 3, Part A, II.C)

- a. Annually whenever a significant increase in emissions occurs as follows:

For any criteria pollutant:

For sources emitting **less than 100 tons per year of a criteria pollutant**, a change in annual actual emissions of five (5) tons per year or more, above the level reported on the last APEN; or

For volatile organic compounds (VOC) and nitrogen oxides sources (NO_x) in ozone nonattainment areas emitting **less than one hundred tons of VOC or NO_x per year**, a change in annual actual emissions of one (1) ton per year or more or five percent, whichever is greater, above the level reported on the last APEN; or

For sources emitting **100 tons per year or more of a criteria pollutant**, a change in annual actual emissions of five percent or fifty (50) tons per year or more, whichever is less, above the level reported on the last APEN submitted; or

For sources emitting **any amount of lead**, a change in actual emissions of fifty (50) pounds of lead above the level reported on the last APEN submitted.

For any non-criteria reportable pollutant:

If the emissions increase by 50% or five (5) tons per year, whichever is less, above the level reported on the last APEN submitted to the Division.

- b. Whenever there is a change in the owner or operator of any facility, process, or activity; or
 - c. Whenever new control equipment is installed, or whenever a different type of control equipment replaces an existing type of control equipment; or
 - d. Whenever a permit limitation must be modified; or
 - e. No later than 30 days before the existing APEN expires.
18. Operating Permit (OP) requirements shall apply to this source at any such time that the facility wide potential to emit equals or exceeds the major source level. Once the facility wide potential to emit equals or exceeds the major source level a Title V operating permit application shall be submitted in accordance with the requirements in Regulation No. 3, Part C.

GENERAL TERMS AND CONDITIONS:

19. This permit and any attachments must be retained and made available for inspection upon request. The permit may be reissued to a new owner by the Division as provided in Regulation No. 3, Part B, Section II.B upon a request for transfer of ownership and the submittal of a revised APEN and the required fee.
20. If this permit specifically states that final approval has been granted, then the remainder of this condition is not applicable. Otherwise, the issuance of this construction permit does not provide "final" authority for this activity or operation of this source. Final approval of the permit must be secured from the Division in writing in accordance with the provisions of 25-7-114.5(12)(a) C.R.S. and Regulation No. 3, Part B, Section III.G. Final approval cannot be granted until the operation or activity commences and has been verified by the Division as conforming in all respects with the conditions of the permit. Once self-certification of all points has been reviewed and approved by the Division, it will provide written documentation of such final approval. **Details for obtaining final approval to operate are located in the Requirements to Self-Certify for Final Approval section of this permit.**
21. This permit is issued in reliance upon the accuracy and completeness of information supplied by the applicant and is conditioned upon conduct of the activity, or construction, installation and operation of the source, in accordance with this information and with representations made by the applicant or applicant's agents. It is valid only for the equipment and operations or activity specifically identified on the permit.
22. Unless specifically stated otherwise, the general and specific conditions contained in this permit have been determined by the Division to be necessary to assure compliance with the provisions of Section 25-7-114.5(7)(a), C.R.S.
23. Each and every condition of this permit is a material part hereof and is not severable. Any challenge to or appeal of a condition hereof shall constitute a rejection of the entire permit and upon such occurrence, this permit shall be deemed denied *ab initio*. This permit may be revoked at any time prior to self-certification and final authorization by the Division on grounds set forth in the Colorado Air Pollution Prevention and Control Act and regulations of the AQCC

including failure to meet any express term or condition of the permit. If the Division denies a permit, conditions imposed upon a permit are contested by the applicant, or if the Division revokes a permit, the applicant or owner or operator of a source may request a hearing before the AQCC for review of the Division's action.

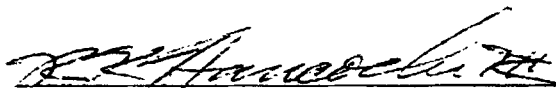
24. Section 25-7-114.7(2)(a), C.R.S. requires that all sources required to file an Air Pollution Emission Notice (APEN) must pay an annual fee to cover the costs of inspections and administration. If a source or activity is to be discontinued, the owner must notify the Division in writing requesting a cancellation of the permit. Upon notification, annual fee billing will terminate.
25. Violation of the terms of a permit or of the provisions of the Colorado Air Pollution Prevention and Control Act or the regulations of the AQCC may result in administrative, civil and/or criminal enforcement actions under Sections 25-7-115 (enforcement), -121 (injunctions), -122 (civil penalties), -122.1 (criminal penalties), C.R.S.

By:



Renee Mayer
Permit Engineer

By:



R K Hancock III, P.E.
Construction Permits Unit Supervisor

Permit History

Issuance	Date	Description
Initial Approval	This Issuance	Issued to Wal-Mart Stores, Inc.

Notes to Permit Holder (as of date of permit issuance):

- 1) The production or raw material processing limits and emission limits contained in this permit are based on the consumption rates requested in the permit application. These limits may be revised upon request of the permittee providing there is no exceedance of any specific emission control regulation or any ambient air quality standard. A revised air pollution emission notice (APEN) and application form must be submitted with a request for a permit revision.
- 2) This source is subject to the Common Provisions Regulation Part II, Subpart E, Affirmative Defense Provision for Excess Emissions During Malfunctions. The permittee shall notify the Division of any malfunction condition which causes a violation of any emission limit or limits stated in this permit as soon as possible, but no later than noon of the next working day, followed by written notice to the Division addressing all of the criteria set forth in Part II.E.1. of the Common Provisions Regulation. See:
<http://www.cdphe.state.co.us/regulations/airregs/5CCR1001-2.pdf>.
- 3) The emission levels contained in this permit are based on the following emission factors:

Points 001 - 024:

CAS	Pollutant	Emission Factors - Uncontrolled		Emission Factors - Controlled	
		lb/hr	Source	lb/hr	Source
-	NO _x	30.2506	Mfg	30.2506	Mfg

Emission factors were originally submitted in units of g/kW-hr and lb/hp-hr. These factors were converted to units of lb/hr for simpler record keeping.

- 4) The following equipment is currently exempt from construction permitting requirements and/or APEN reporting requirements based on information provided by the operator for the Division's analysis:

AIRS ID	Facility ID	Description	Notes	
041/2067/025 & 026	CT-001 & CT002	Induced draft, counter flow evaporative cooling towers	APEN Exempt, Permit Exempt	These units are exempt from APEN and construction permitting requirements because particulate emissions are less than 2 tons per year.

- 5) In accordance with C.R.S. 25-7-114.1, the Air Pollutant Emission Notices (APENs) associated with this permit are valid for a term of five years. As of the issuance of this permit, the five-year term for these APENs expires per the table below. A revised APEN shall be submitted no later than 30 days before the five-year term expires.

AIRS Point	Date of Expiration
001 - 024	February 8, 2017

- 6) This facility is classified as follows:

Applicable Requirement	Status
Operating Permit	Synthetic Minor Facility for NO _x
PSD	Minor Facility

- 7) Full text of the Title 40, Protection of Environment Electronic Code of Federal Regulations can be found at the website listed below:

<http://ecfr.gpoaccess.gov/>

Part 60: Standards of Performance for New Stationary Sources		
NSPS	60.4200-60.4219	Subpart IIII

- 8) Certification documentation of compliance with the NSPS IIII emission standards was received with the initial application.

Wal-Mart Stores, Inc.
Colorado Data Center
Colorado Springs, CO

**AUTHORIZATION FOR CB&I TO ACT AS PERMITTING
AGENT FOR WAL-MART**



Shaw Environmental, Inc.

****NOTE: CB&I has acquired The Shaw Group**

January 15, 2014

CB&I has acquired The Shaw Group Inc (Shaw Environmental, Inc.). You will see our email addresses and company logo changing to reflect CB&I.

RE: Walmart / CB&I (Formerly Shaw) Partnership for Managing Permitting Requirements

To Whom It May Concern,

This letter is to inform you that Wal-Mart Stores, Inc. has contracted with Shaw Environmental Inc. (CB&I) to manage **environmental related permit renewals** for an indefinite period of time. Environmental permitting, registration, notification responsibilities will now be handled by Shaw.

Please note: Submittals that do not come from CB&I should not be returned to CB&I, these should be sent back to the original party who submitted them.

Walmart has provided the attached limited Power of Attorney which provides CB&I the authority to sign applications as an agent for Wal-Mart Stores, Inc.

Any future correspondence, permits and associated **renewal** invoices for **environmental related items** should be provided to:

**Shaw Environmental, Inc. (CB&I)
ATTN: Licensing Support
11206 Thompson Avenue
Lenexa, KS 66219**

If you have any additional questions, please contact Shaw Licensing at the following:

Phone: 877-829-5505

Fax: 225-987-3705

Email: walmartepmsupport@cbi.com

Thank you,
Shaw Environmental, Inc.

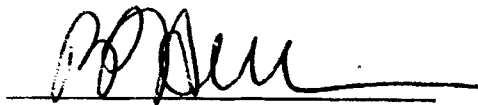
SPECIAL POWER OF ATTORNEY

We, Phyllis Harris, Sr. Vice President & Chief Compliance Officer, and Andrea Lazenby, Assistant Secretary, acting on behalf of WAL-MART STORES, INC., in its own capacity, and in its capacity as parent corporation of wholly-owned subsidiaries SAM'S WEST, INC., SAM'S REAL ESTATE BUSINESS TRUST, WAL-MART REALTY CO., WALMART PROPERTY CO. and WAL-MART REAL ESTATE BUSINESS TRUST (collectively, the "SUBSIDIARIES"), do hereby appoint Shaw Environmental, a CB&I Company, of 4171 Essen Lane, Baton Rouge, Baton Rouge Parrish, Louisiana, as our attorney in fact to act in our place for the purpose of signing and processing the following on behalf of WAL-MART STORES, INC. and SUBSIDIARIES:

- (i) All documents required by any governmental agency regarding new environmental permits and renewal of existing environmental permits required for WAL-MART STORES, INC. OR SUBSIDIARIES;
- (ii) All documentation required to update the corporate records on file with governmental agencies identifying the Officers authorized to sign documents on behalf of WALMART STORES, INC. or SUBSIDIARIES; and

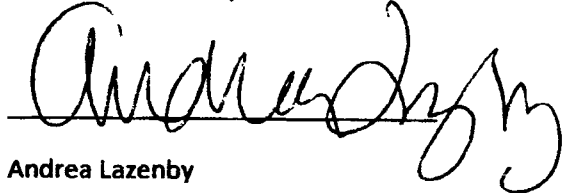
We further grant to our attorney in fact full authority to act in any manner both proper and necessary to the exercise of the foregoing powers, including the full power of substitution and revocation, and ratify every act that they may lawfully perform in exercising those powers. This power of attorney is granted for the period beginning on the execution date below until December 31, 2015

Executed on 1-17, 2014, at Bentonville, Arkansas.



Phyllis Harris

SVP and Chief Compliance officer



Andrea Lazenby

Assistant Secretary

ACKNOWLEDGEMENT

STATE OF ARKANSAS

COUNTY OF BENTON

On 117, 2014, before me, TIM FARRAN
Notary Public, personally appeared PHYLLIS HARRIS and ANDREA LAZENBY, acting on behalf of WAL-
MART STORES, INC., who proved to me on the basis of satisfactory evidence to be the persons whose
names are subscribed to the within instrument and acknowledged to me that they executed the same in
their authorized capacities, and that by their signatures on the instrument the persons, or entity upon
behalf of which the persons acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of Arkansas that the foregoing
paragraph is true and correct.

WITNESS my hand and official seal.

A handwritten signature in cursive script, reading "Tim Farran", written over a horizontal line.

Signature of Notary Public

My Commission Expires: 4-15-15



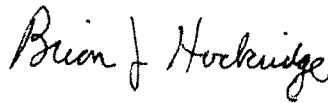
Caterpillar Inc.
P.O. Box 600
Mossville, Illinois 61552

March 26, 2012

To Whom It May Concern:

Caterpillar Inc. confirms that engine families CCPXL78.1NZS and CCPXL106.NZS are certified in accordance with EPA procedures that allow ratings with multiple power categories to be combined into one power category for certification. In this case, two power categories, $560 < kW \leq 2237$ and $kW > 2237$, were combined into power category $560 < kW \leq 2237$. The 3500 and C175 engine ratings on the following tables are certified in CCPXL78.1NZS and CCPXL106.NZS engine families using the one power category.

Sincerely,

 / SEM

Brian J. Hockridge
Manager, Global Emissions Certification
Large Power Systems Division
Caterpillar Inc.

Telephone: (309) 578-4078
Hockridge_Brian_J@cat.com

EPA Engine Family Name	Model Year	Engine Model	Rated Power (kW)	Rated Speed (RPM)
CCPXL78.1NZS	2012	3516C	2710	1800
CCPXL78.1NZS	2012	3512C	1864	1900
CCPXL78.1NZS	2012	3516C	2710	1800
CCPXL78.1NZS	2012	3516C	2441	1800
CCPXL78.1NZS	2012	3516C	2475	1800
CCPXL78.1NZS	2012	3516C	2235	1800
CCPXL78.1NZS	2012	3516C	2240	1800
CCPXL78.1NZS	2012	3516C	2445	1800
CCPXL78.1NZS	2012	3516C	2030	1800
CCPXL78.1NZS	2012	3516C	1436	1500
CCPXL78.1NZS	2012	3516C	1940	1800
CCPXL78.1NZS	2012	3516C	2190	1800
CCPXL78.1NZS	2012	3516C	2010	1800
CCPXL78.1NZS	2012	3516C	1820	1800
CCPXL78.1NZS	2012	3512C	1645	1800
CCPXL78.1NZS	2012	3512C	1500	1800
CCPXL78.1NZS	2012	3512C	1360	1800
CCPXL78.1NZS	2012	3512C	1415	1800
CCPXL78.1NZS	2012	3512C	1864	1900
CCPXL78.1NZS	2012	3512C	1101	1200
CCPXL78.1NZS	2012	3508C	671	1200
CCPXL78.1NZS	2012	3512C	932	1200
EPA Engine Family Name	Model Year	Engine Model	Rated Power (kW)	Rated Speed (RPM)
CCPXL106.NZS	2012	C175-16	3298	1800
CCPXL106.NZS	2012	C175-16	3298	1800
CCPXL106.NZS	2012	C175-16	3008	1800
CCPXL106.NZS	2012	C175-16	2772	1800
CCPXL106.NZS	2012	C175-16	3263	1800
CCPXL106.NZS	2012	C175-16	2974	1800
CCPXL106.NZS	2012	C175-16	2737	1800

APPENDIX G – EPA CERTIFICATE OF CONFORMITY

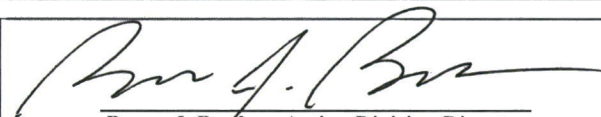


UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2012 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT OF 1990

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Caterpillar Inc.**
(U.S. Manufacturer or Importer)
Certificate Number: **CCPXL78.1NZS-028**

Effective Date:
11/28/2011
Expiration Date:
12/31/2012


Byron J. Bunker, Acting Division Director
Compliance Division

Issue Date:
11/28/2011
Revision Date:
N/A

Model Year: 2012
Manufacturer Type: Original Engine Manufacturer
Engine Family: CCPXL78.1NZS

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 560<kW<=2237
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Engine Design Modification, Smoke Puff Limiter, Electronic Control

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Regulatory Information

EPA TIER 2		2006 - 2010		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 89 SUBPART D AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	NON-ROAD	TIER 2	CO: 3.5 NOx + HC: 6.4 PM: 0.20

EPA EMERGENCY STATIONARY		2011 - ---		
GASEOUS EMISSIONS DATA MEASUREMENTS ARE CONSISTENT WITH THOSE DESCRIBED IN EPA 40 CFR PART 60 SUBPART IIII AND ISO 8178 FOR MEASURING HC, CO, PM, AND NOX. GASEOUS EMISSIONS LIMIT VALUES ARE WEIGHTED CYCLE AVERAGES AND ARE IN COMPLIANCE WITH THE NON-ROAD REGULATIONS.				
Locality	Agency	Regulation	Tier/Stage	Max Limits - G/BKW - HR
U.S. (INCL CALIF)	EPA	STATIONARY	EMERGENCY STATIONARY	CO: 3.5 NOx + HC: 6.4 PM: 0.20

Altitude Derate Data

ALTITUDE CORRECTED POWER CAPABILITY (BHP)

AMBIENT OPERATING TEMP (F)	50	60	70	80	90	100	110	120	130	NORMAL
ALTITUDE (FT)										
0	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,634
1,000	3,634	3,634	3,634	3,634	3,634	3,634	3,634	3,625	3,583	3,634
2,000	3,634	3,634	3,634	3,634	3,634	3,614	3,551	3,490	3,430	3,634
3,000	3,634	3,634	3,634	3,607	3,542	3,478	3,417	3,358	3,301	3,634
4,000	3,634	3,604	3,536	3,470	3,407	3,346	3,288	3,231	3,176	3,574
5,000	3,534	3,466	3,401	3,338	3,277	3,218	3,162	3,107	3,055	3,461
6,000	3,398	3,332	3,270	3,209	3,151	3,094	3,040	2,987	2,937	3,351
7,000	3,266	3,203	3,142	3,084	3,028	2,974	2,922	2,871	2,823	3,243
8,000	3,137	3,077	3,019	2,963	2,909	2,857	2,807	2,758	2,712	3,137
9,000	3,013	2,955	2,899	2,845	2,794	2,744	2,696	2,649	2,604	3,034
10,000	2,892	2,837	2,783	2,732	2,682	2,634	2,588	2,543	2,500	2,933
11,000	2,776	2,722	2,671	2,621	2,574	2,528	2,483	2,441	2,399	2,835
12,000	2,663	2,611	2,562	2,515	2,469	2,425	2,382	2,341	2,301	2,739
13,000	2,553	2,504	2,457	2,411	2,367	2,325	2,284	2,245	2,207	2,645
14,000	2,447	2,400	2,354	2,311	2,269	2,228	2,189	2,151	2,115	2,554
15,000	2,344	2,299	2,256	2,214	2,174	2,135	2,097	2,061	2,026	2,465